

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference F178822	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416																								
International application No. PCT/US04/02712	International filing date (day/month/year) 30 January 2004 (30.01.2004)	Priority date (day/month/year) 11 July 2003 (11.07.2003)																									
International Patent Classification (IPC) or national classification and IPC IPC(7): B29C 39/00; C04B 26/00 and US Cl.: 106/15.05, 802, 817; 264/9, 319, 331.11, 333																											
Applicant MICROBAN PRODUCTS COMPANY																											
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>11</u> sheets, as follows:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).  <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.         </div> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Anthony J. Green Telephone No. 571-272-1700																									

Form PCT/IPEA/409 (cover sheet)(January 2004)

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# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/02712

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☐ the international application as originally filed/furnished
  - ☒ the description:
    - pages 1-23 as originally filed/furnished
    - pages\* NONE received by this Authority on \_\_\_\_\_
    - pages\* NONE received by this Authority on \_\_\_\_\_
  - ☒ the claims:
    - pages NONE as originally filed/furnished
    - pages\* NONE as amended (together with any statement) under Article 19
    - pages\* NONE received by this Authority on \_\_\_\_\_
    - pages\* 24-33 received by this Authority on 14 October 2004 (14.10.2004)
  - ☐ the drawings:
    - pages NONE as originally filed/furnished
    - pages\* NONE received by this Authority on \_\_\_\_\_
    - pages\* NONE received by this Authority on \_\_\_\_\_
  - ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, Nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

Form PCT/IPEA/409 (Box No. I) (January 2004)

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US04/02712**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty (N)	Claims <u>1-65</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>14-18 and 52-56</u>	YES
	Claims <u>1-13, 19-51 and 57-65</u>	NO
Industrial Applicability (IA)	Claims <u>1-65</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)  
Please See Continuation Sheet

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/02712

**Box No. VIII**      **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1-65 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims are indefinite for the following reason(s):

    In claim 1 it is unclear as to the types of natural aggregates, polymeric binders, curing agents and antimicrobial agents encompassed by the claim.

    In claim 28 it is unclear as to the types of natural aggregates, polymeric binders, and antimicrobial agents encompassed by the claim.

    In claim 30 the phrase "the natural aggregate material" lacks proper antecedent basis.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

**V. 2. Citations and Explanations:**

Claims 1-13 and 19-27 lack an inventive step under PCT Article 33(3) as being obvious over Yamanashi et al (US Patent Application Publication No. 2003/0087074).

The reference teaches, in the abstract, the examples and the claims, the formation of an artificial stone composition comprising an aggregate such as quartz, an optional filler, a resin and which may also include a hardening agent (see example 1 and paragraph [0064]). Paragraph [0121] and [0122] teach that antimicrobial agents may be added if desired.

The instant claims are obvious over the reference. While the reference does not specifically teach the production of a composition comprising an antimicrobial agent, it does teach that one may add one and accordingly it is within the level of ordinary skill in the art to add an antimicrobial agent if one is needed or desired. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13 and 19-22 and 24-27 lack an inventive step under PCT Article 33(3) as being obvious over Cuffaro et al (US Patent No. 3,670,060) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Cuffaro et al teach, in the abstract, the examples and the claims, a method for manufacturing artificial marble comprising particulate natural stone, powdered thermosetting resin, a powdered catalyst for the resin and a pigment.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13 and 19-27 lack an inventive step under PCT Article 33(3) as being obvious over Mangrum (US Patent No. 3,278,662) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Mangrum teaches, in the abstract, the examples and the claims, a method for manufacturing tile embodying stone particles comprising stone particles, a thermosetting resin, a catalyst for the resin and fillers.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary.

## Supplemental Box

As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13 and 19-22 and 24-27 lack an inventive step under PCT Article 33(3) as being obvious over Slocum (US Patent No. 5,321,055) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Slocum teaches, in the abstract, the examples and the claims, a method for manufacturing a synthetic quartzite-marble/granite material comprising a mixture of resins, granite particles and also peroxide as a catalyst for the resin and optionally fillers.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13 and 19-27 lack an inventive step under PCT Article 33(3) as being obvious over Sakai (US Patent No. 6,136,226) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Sakai teaches, in the abstract, the examples and the claims, a method for manufacturing a luminous or fluorescent artificial stone comprising a powder such as a glass powder, a resin and a curing agent for the resin (see especially examples 1 and 3).

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13, 19-51 and 57-65 lack an inventive step under PCT Article 33(3) as being obvious over Brubaker et al (US Patent No. 4,595,626) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Brubaker et al teaches, in the abstract, the examples and the claims, the formation of a conformable tile comprising an aggregate material, a polyester resin and a curing initiator. The composition is molded under pressure, heat, vibration etc.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13, 19-51 and 57-65 lack an inventive step under PCT Article 33(3) as being obvious over Charlebois (US Patent No. 5,800,752) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Charlebois teaches, in the abstract, the examples and the claims, the formation of polymer composite products by the simultaneous application of vibration, heat and pressure. The compositions include polymeric binders, aggregates and a catalyst for the binder.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-13, 19-51 and 57-65 lack an inventive step under PCT Article 33(3) as being obvious over Wilkinson et al (US Patent No. 6,387,985) in view of Yamanashi et al (US Patent Application Publication No. 2003/0087074).

Wilkinson et al teaches, in the abstract, the examples and the claims, the formation of acrylic polymer based formulations comprising crushed stone, resins, fillers and also which may include curing agents. The formulation is molded using a vibro-compact mold.

The instant claims are obvious over the reference. While the primary reference does not teach the addition of an antimicrobial agent it is known in the art to add antimicrobial agents to artificial stone compositions in order to prevent microbial attack (as taught by Yamanashi et al). Accordingly in the absence of evidence to the contrary it would have been obvious to add an antimicrobial agent to the composition of the primary reference and thus arrive at the instant invention absent evidence to the contrary. As for the amount of the antimicrobial agent, it would be obvious to utilize effective amounts to prevent microbial growth.

Claims 1-65 meet the criteria set out in PCT Article 33(2) and claims 14-18 and 52-56 meet the criteria set out in PCT Article 33(3), because the prior art does not teach or fairly suggest the use of an organic antimicrobial agent in combination with artificial stone

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**Supplemental Box**

compositions.

Claims 1-65 meet the criteria set out in PCT Article 33(4), and thus are industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

### Claims

1. (Amended) A composite material having an appearance similar to that of natural stone, said material comprising:  
a natural aggregate,  
a polymeric binder,  
a curing agent, and  
an antimicrobial agent.
2. (Amended) The composite material according to claim 1 wherein said natural aggregate is selected from the group consisting of calcium carbonate, marble, granite, quartz, feldspar, marble and quartzite and mixtures thereof.
3. (Amended) The composite material according to claim 2 further comprising a filler selected from the group consisting of fumed silica, sand, clay, fly ash, cement, broken ceramics, mica, silicate flakes, broken glass, glass beads, glass spheres, mirror fragments, steel grit, aluminum grit, carbides, plastic beads, pelletized rubber, ground polymer composites, wood chips, sawdust, paper laminates, pigments, colorants, and mixtures thereof.
4. (Amended) The composite material according to claim 2 wherein said natural aggregate makes up between about 85% to about 96% by weight of the composite material.
5. (Amended) The composite material according to claim 4 wherein said natural aggregate makes up between about 89% to about 93% by weight of the composite material.
6. (Amended) The composite material according to claim 4 wherein the polymeric binder makes up between about 4% to about 15% by weight of the composite material.



7. (Amended) The composite material according to claim 6 wherein said polymeric binder makes up between about 6% to about 10% by weight of the composite material.

8. (Amended) The composite material according to claim 1 wherein said polymeric binder is selected from the group consisting of monomers, a mixture of monomers, polymers, a mixture of polymers, and a mixture of monomers and polymers.

9. (Amended) The composite material according to claim 8 wherein said polymeric binder is a polymer and is selected from the group consisting of thermoplastic polymers and thermosetting polymers.

10. (Amended) The composite material according to claim 9 wherein said polymeric binder is a polymer and is selected from the group consisting of polyester, vinyl ester, epoxy, phenolic resin, urethane, and mixtures thereof.

11. (Amended) The composite material according to claim 8 wherein said polymeric binder is a monomer and is selected from the group consisting of acrylics, styrene, styrene derivatives, vinyl toluene, divinyl benzene, methyl acrylate, ethyl acrylate, isopropyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, butyl methacrylate, phenols, and furans.

12. (Amended) The composite material according to claim 11 wherein said monomer is selected from the group consisting of styrene, methyl methacrylate and butyl acrylate.

13. (Amended) The composite material according to claim 1 wherein said antimicrobial agent is selected from the group consisting of organic and inorganic antimicrobial agents.

14. (Amended) The composite material according to claim 13 wherein said antimicrobial agent is organic and is present in said composite material in a quantity between about 500 ppm and 10,000 ppm.

15. (Amended) The composite material according to claim 14 wherein said antimicrobial agent is organic and is present in said composite material in a quantity between about 800 ppm and 7000 ppm.

16. (Amended) The composite material according to claim 14 wherein said antimicrobial agent is organic and is selected from the group consisting of quarternary ammonium compounds, quarternary ammonium compounds having an unsaturated reactive group, metals, and antimicrobial agents exhibiting the ability to migrate through said polymeric binder.

17. (Amended) The composite material according to claim 16 wherein said antimicrobial agent is selected from the group consisting of triclosan, tolyl diiodomethyl sulfone, zinc pyrithione, sodium pyrithione, ortho phenylphenol, sodium ortho phenylphenol, iodo2-propynyl butylcarbamate, poly [oxyethylene(dimethyliminio) ethylene(dimethyliminio)ethylene chloride], propiconazole, tebuconazole, bethoxazin, thiabendazole, polyhexamethylene biguanide, 1,3,5-triazine-1,3,5(2H,4H,6H)-triethanol, isothiazalinones, and mixtures thereof.

18. (Amended) The composite material according to claim 17 wherein the polymeric binder is polyester and said antimicrobial agent is triclosan, wherein said triclosan is present in the composite material in a quantity between about 800 ppm and 5000 ppm.

19. (Amended) The composite material according to claim 13 wherein said antimicrobial agent is an inorganic agent and is selected from the group consisting of metal salts, ceramics containing metals, zeolites containing metals, and mixtures thereof.

20. (Amended) The composite material according to claim 19 wherein said antimicrobial agent is selected from the group consisting of salts of silver, copper, zinc, mercury, tin, lead, bismuth, barium, cadmium, and mixtures thereof.

21. (Amended) The composite material according to claim 20 wherein said antimicrobial agent comprises silver and is selected from the group consisting of silver acetate, silver benzoate, silver carbonate, silver iodate, silver iodide, silver lactate, silver laurate, silver nitrate, silver oxide, silver palmitate, silver sulfadiazine, ceramics containing silver, zeolites containing silver, and mixtures thereof.

22. (Amended) The composite material according to claim 19 wherein said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

23. (Amended) The composite material according to claim 21 wherein the binder is polyester and said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

24. (Amended) The composite material according to claim 1 wherein said antimicrobial agent is present in an amount sufficient to demonstrate commercially acceptable efficacy against a microbe of concern.

25. A finished product comprising the composite material according to claim 1.

26. (Amended) The finished product according to claim 25 selected from the group consisting of a tabletop, a countertop, architectural facings, walkways, home furnishings, patio furniture, decorative stone, indoor and outdoor tile, flooring, mantles, wall facings, bathroom fixtures, and imitation stone structures.

27. (Amended) The composite material according to claim 1 further comprising a colorant.

28. (Amended) A process for manufacturing a composite material, said process comprising the steps of:

obtaining a natural aggregate of appropriate dimension;

combining said natural aggregate with a polymeric binder to form an aggregate and binder mixture;

adding an antimicrobial agent to said aggregate and binder mixture;

distributing said aggregate and binder mixture comprising antimicrobial agent in a mold; and

curing said aggregate and binder mixture comprising antimicrobial agent by application of heat and pressure and vibration.

29. (Amended) The process according to claim 28 wherein said natural aggregate is combined with said polymeric binder in a quantity such that it makes up between about 85% to about 96% by weight of said aggregate and binder mixture.

30. (Amended) The process according to claim 29 wherein said natural aggregate makes up between about 89% to about 93% by weight of the composite material.

31. (Amended) The process according to claim 28 wherein the step of obtaining the natural aggregate comprises obtaining a natural aggregate selected from the group consisting of calcium carbonate, quartz, granite, feldspar, marble, quartzite, and mixtures thereof.

32. (Amended) The process according to claim 31 further comprising the step of combining the aggregate with a filler selected from the group consisting of fumed silica, sand, clay, fly ash, cement, broken ceramics, mica, silicate flakes, broken glass, glass beads, glass spheres, mirror fragments, steel grit, aluminum grit, carbides, plastic beads, pelletized rubber, ground polymer composites, wood chips, sawdust, paper laminates, pigments, colorants, and mixtures thereof.

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33. (Amended) The process according to claim 31 wherein said natural aggregate is selected from the group consisting of granite, marble, quartz and mixtures thereof.

34. (Amended) The process according to claim 28 wherein said polymeric binder is combined with said natural aggregate in a quantity such that said polymeric binder makes up between about 4% to about 15% by weight of said aggregate and binder mixture.

35. (Amended) The process according to claim 34 wherein said polymeric binder makes up between about 6% to about 10% by weight of said aggregate and binder mixture.

36. (Amended) The process according to claim 28 wherein said polymeric binder is selected from the group consisting of monomers, a mixture of monomers, polymers, a mixture of polymers, and a mixture of monomers and polymers.

37. (Amended) The process according to claim 28 wherein said polymeric binder is a polymer and is selected from the group consisting of thermoplastic polymers and thermosetting polymers.

38. (Amended) The process according to claim 37 wherein said polymeric binder is a polymer and is selected from the group consisting of polyester, vinyl ester, epoxy, phenolic resin, urethane, and mixtures thereof.

39. (Amended) The process according to claim 36 wherein said polymeric binder is a monomer and is selected from the group consisting of styrene, styrene derivatives, vinyl toluene, divinyl benzene, methyl acrylate, ethyl acrylate, isopropyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, butyl methacrylate, phenols, and furans.

40. (Amended) The process according to claim 39 wherein said monomer is selected from the group consisting of styrene, methyl methacrylate and butyl acrylate.

41. (Amended) The process according to claim 34 wherein said polymeric binder is polyester.

42. (Amended) The process according to claim 28 further comprising the step of placing the aggregate and binder mixture under a vacuum.

43. (Amended) The process according to claim 42 wherein the vacuum is maintained as said aggregate and binder mixture is distributed into the mold.

44. (Amended) The process according to claim 28 wherein the step of curing the mixture under pressure comprises application of a vacuum.

45. (Amended) The process according to claim 42 wherein the curing step comprises application of heat between ambient and about 200°C.

46. (Amended) The process according to claim 28 wherein the applied pressure is between about 70 tons and about 140 tons.

47. (Amended) The process according to claim 28 wherein the step of adding an antimicrobial agent to said aggregate and binder mixture comprises adding said antimicrobial agent directly to said aggregate and binder mixture.

48. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent to said aggregate and binder mixture comprises adding said antimicrobial agent to said polymeric binder prior to combining the natural aggregate with the polymeric binder.

49. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent to said aggregate and binder mixture comprises combining said antimicrobial agent with a colorant and then adding said antimicrobial agent and colorant to said aggregate and binder mixture.

50. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent comprises adding said antimicrobial agent to a polymeric layer adjacent an outer surface of the cured mixture.

51. (Amended) The process according to claim 28 wherein the antimicrobial agent is selected from the group consisting of organic and inorganic agents.

52. (Amended) The process according to claim 51 wherein the antimicrobial agent is organic and is added in an amount sufficient to constitute between about 500 ppm and 10,000 ppm of said aggregate and binder mixture.

53. (Amended) The process according to claim 52 wherein the antimicrobial agent is organic and is added in an amount of between about 800 ppm and 7000 ppm of said aggregate and binder mixture.

54. (Amended) The process according to claim 52 wherein the antimicrobial agent is an organic antimicrobial agent and is selected from the group consisting of quarternary ammonium compounds, quarternary ammonium compounds having an unsaturated reactive group, metals, and organic antimicrobial agents exhibiting the ability to migrate through said polymeric binder, and mixtures thereof.

55. (Amended) The process according to claim 54 wherein the antimicrobial agent is selected from the group consisting of triclosan, tolyl diiodomethyl sulfone, zinc pyrithione, sodium pyrithione, ortho phenylphenol, sodium ortho phenylphenol, iodo-2-propynyl butylcarbamate, poly[oxyethylene(dimethyliminio) ethylene(dimethyliminio)ethylene chloride], propiconazole, tebuconazole, bethoxazin, thiabendazole, polyhexamethylene biguanide, 1,3,5-triazine-1,3,5-(2H,4H,6H)-triethanol, isothiazalinones and mixtures thereof.



56. (Amended) The process according to claim 55 wherein the polymeric binder is polyester and the antimicrobial agent is triclosan, wherein the triclosan is present in the composite material in a quantity between about 800 ppm and 5000 ppm.

57. (Amended) The process according to claim 51 wherein the antimicrobial agent is an inorganic agent and is selected from the group consisting of metal salts, ceramics containing metals, zeolites containing metals, and mixtures thereof.

58. (Amended) The process according to claim 57 wherein the antimicrobial agent is selected from the group consisting of salts of silver, copper, zinc, mercury, tin, lead, bismuth, barium, cadmium, chromium, and mixtures thereof.

59. (Amended) The process according to claim 58 wherein the antimicrobial agent comprises silver and is selected from the group consisting of silver acetate, silver benzoate, silver carbonate, silver iodate, silver iodide, silver lactate, silver laurate, silver nitrate, silver oxide, silver palmitate, silver sulfadiazine, ceramics containing silver, zeolites containing silver, and mixtures thereof.

60. (Amended) The process according to claim 57 wherein said antimicrobial agent is added to the mixture to constitute a concentration between about 1000 ppm and 50,000 ppm of said mixture.

61. (Amended) The process according to claim 59 wherein said polymeric binder is polyester and said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

62. (Amended) The process according to claim 51 wherein said antimicrobial agent is present in an amount sufficient to demonstrate commercially acceptable efficacy against a microbe of concern.

63. (Amended) The process according to claim 28 wherein said polymeric binder comprises a polyester and said antimicrobial agent is triclosan and the triclosan present in the cured mixture is between about 800 ppm and about 5000 ppm based upon the weight of the cured mixture.

64. (Amended) The process according to claim 28 further comprising forming a finished product from the cured mixture.

65. (Amended) The process according to claim 64 wherein the step of forming a finished product comprises forming a tabletop, a countertop, architectural facings, walkways, home furnishings, patio furniture, decorative stone, indoor and outdoor tile, flooring, mantles, wall facings, bathroom fixtures, cutting boards, sinks, showers, tubs, and imitation stone structures.

**Box No. VIII (iv) DECLARATION: INVENTORSHIP** (only for the purposes of the designation of the United States of America)  
*The declaration must conform to the following standards of wording provided for in Section 214; see Notes to Boxes Nos. VII, VIII (i) to (iv) in general and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.*

**Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv))  
 for the purposes of the designation of the United States of America:**

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/..... (if furnishing declaration pursuant to Rule 26ter)

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understood the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications .....

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name: Ivan W. Ong

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Citizenship: Singapore

Inventor's Signature: Ivan W. Ong  
 (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: January 30, 2004  
 (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

Name: Gerald W. Walker

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Inventor's Signature: Gerald W. Walker  
 (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: January 15, 2004  
 (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

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